Project ENVVEST Technical Update
Feb. 24, 2005

Presentation to PSNS&IMF Project ENVVEST Community Advisory Committee

Presented by

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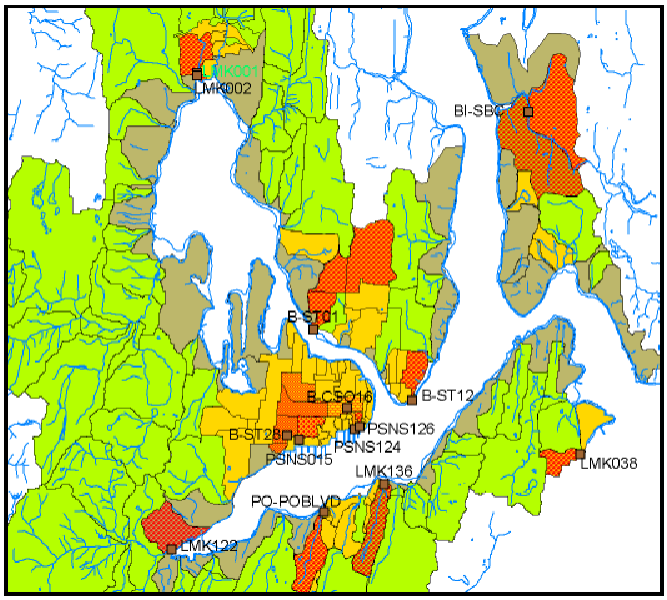
- Introduction
- Storm Event Monitoring
  - Storm Water Flow Monitoring
  - Storm Event Sampling
  - Marine Water Quality Monitoring
- Model Linkage and Verification
- Simulation Example
- Next Steps

Cooperative Storm Event Monitoring

Cooperating with Cities and County to:

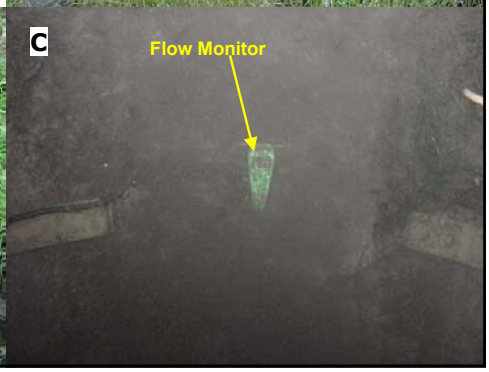
- **Sample representative storm events**
- **Collect data on hydrology and water quality parameters**
- **Relate landuse to environmental quality**
- **Quantify loading from the watershed into the receiving waters of the Inlet**
- **Support TMDLs**

Storm Water Flow Monitoring Locations



Storm Water Flow Monitoring

A. Storm water flow monitoring station in Silverdale on Bucklin Hill Rd.
B. Two outfalls are monitored at same location.
C. Flow monitor attached to bottom of outfall pipe.



Storm Water Flow Monitoring Cont.

D. Flow data logger and hand held computer for down loading data.
E. Servicing data logger and auto sampler.
F. Protective sleeve around tubing used to collect water samples during storm events.

Storm Water Flow Monitoring Cont.

G. Entering manhole with fall protection gear.
H. Looking down manhole vault.
I. Location of flow monitor inside outfall pipe.

G

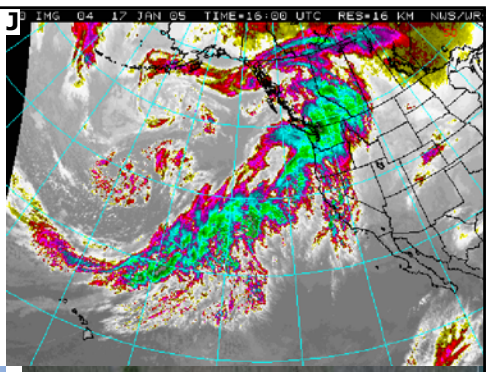
H

I

Storm Event Sampling

J. Onset of storm event.
K. Rainfall on Highway 16.
L. Mouth of Gorst during storm event.

J



K

L

Storm Event Sampling Cont.

M. Storm outfall sampling at Navy City.
N. Highway runoff on Hwy 3.
O. Sampling highway runoff.

M

N

O

Storm Event Sampling Cont.

P. Storm event sampling at Anderson Creek.
Q. Duplicate autosamplers.
R. Discrete fecal coliform samples.
S. Sample jars for storm event composite samples.

P

Q

R

S

Marine Water Quality Monitoring

T. Olympic Mountains from Sinclair Inlet following storm.
U. Sampling ambient conditions in the Inlets.
V. Sampling vessel and equipment.

T

U

V

Linking Watershed and Inlet Models

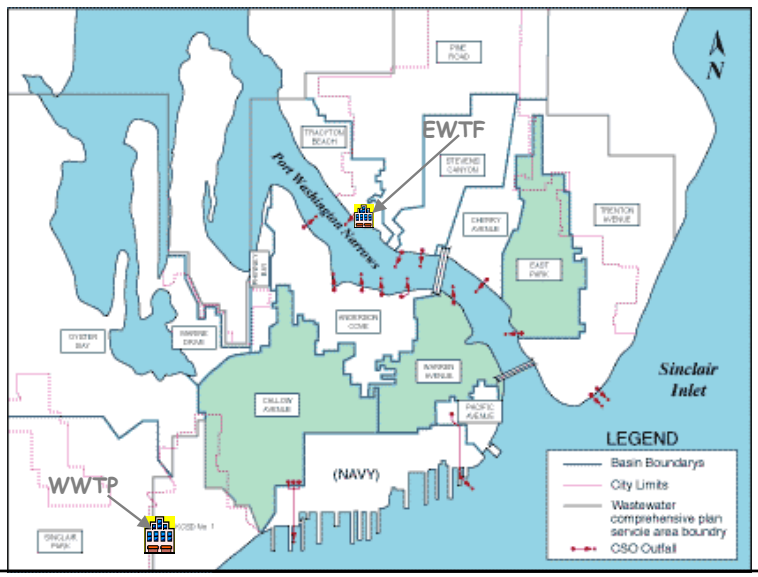
- Freshwater Runoff
  - Streams
  - Storm Water Outfalls
  - Beach Runoff (Sheet Flow)
- Waste Water Treatment Plant Discharges
- Industrial Discharges
- Tides
- Wind

Simulating FC Discharges

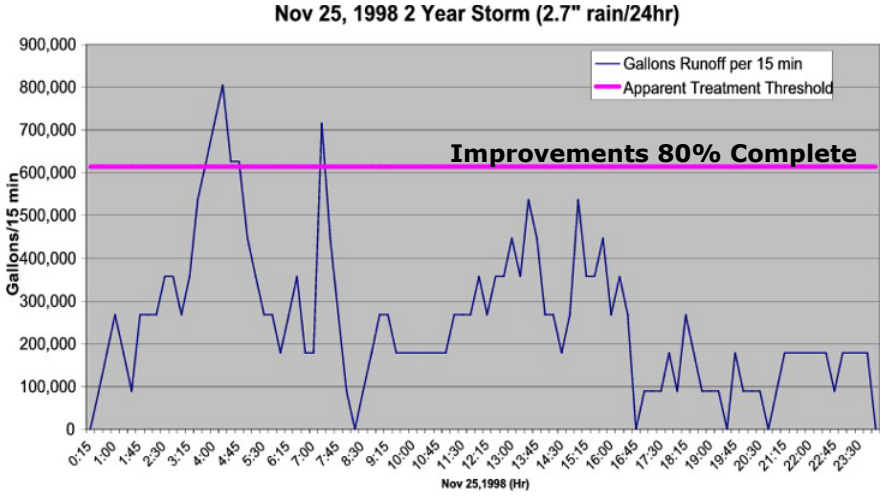
- Combined Sewer Overflows (CSO) in Port Washington Narrows
- Major Improvements to Sanitary and Storm Water System
- Significant Decrease in the Amount and Frequency of CSO Events

http://www.cityofbremerton.com/content/cso_csos.html

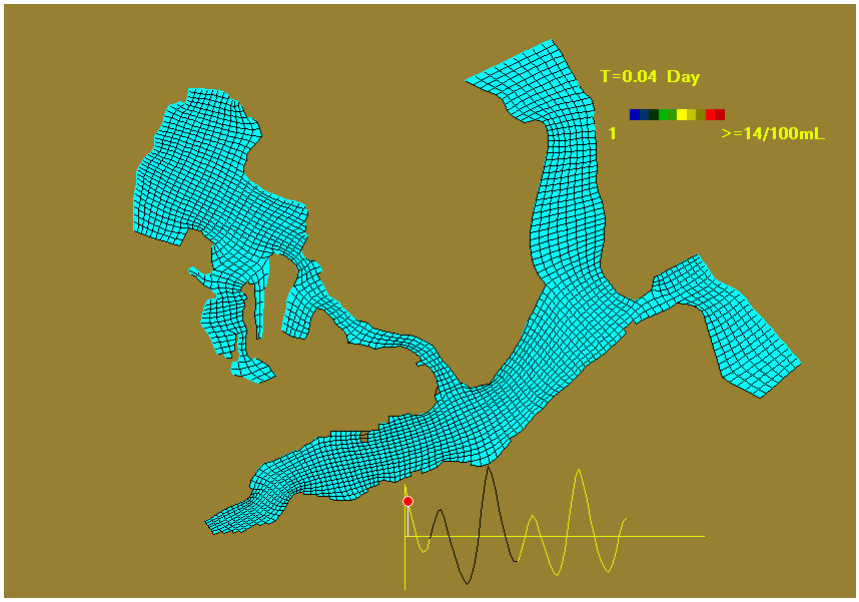
City of Bremerton CSO Reduction Program



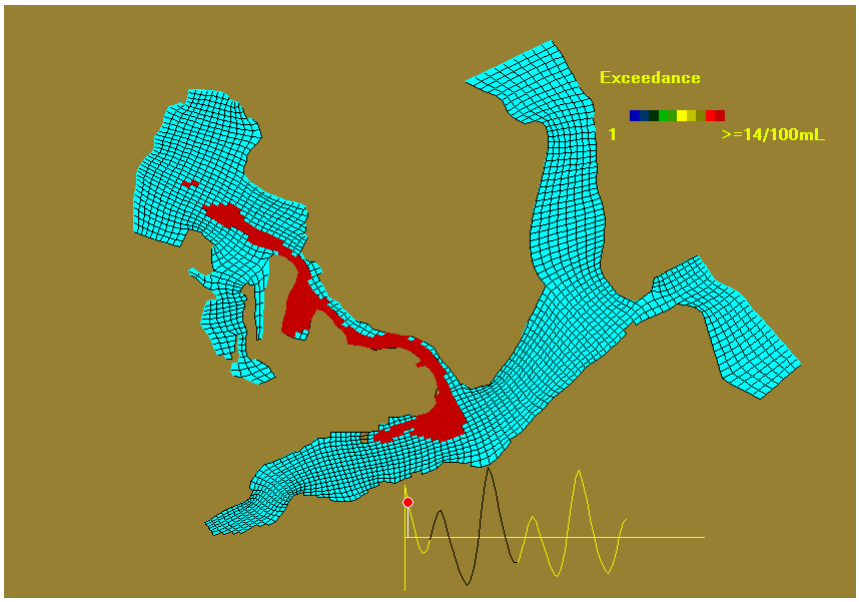
Simulating CSO Event



"Two Year" storm event would generate **429,900** gal of overflow



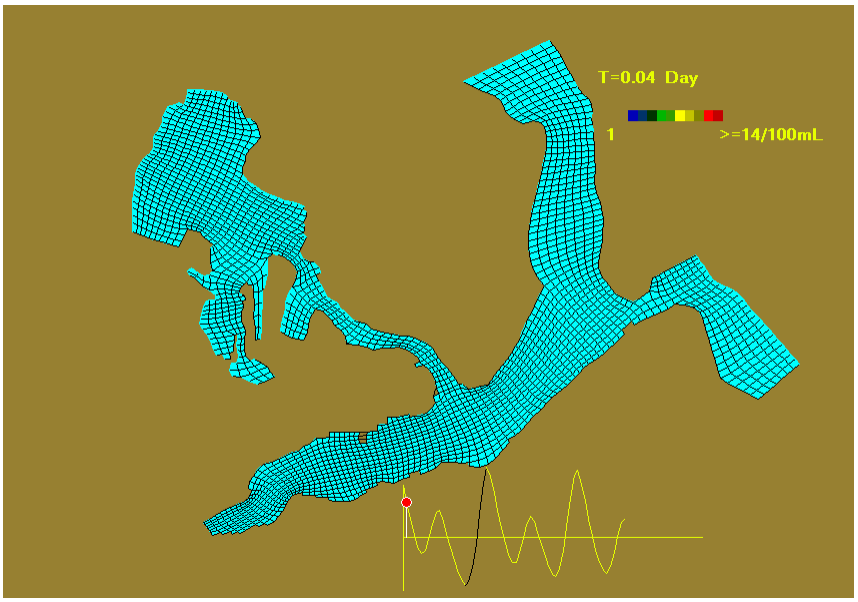
Click here to load animation of typical CSO overflow event assuming CSO improvements are 80% complete.



Area that exceeded shellfish standard during simulation of CSO event with improvements 80% complete.

CSO Improvements 100% Complete

"Two Year" storm event would generate **37,400** gallons of overflow



Click here to load animation of typical CSO overflow event assuming CSO improvements are 100% complete.

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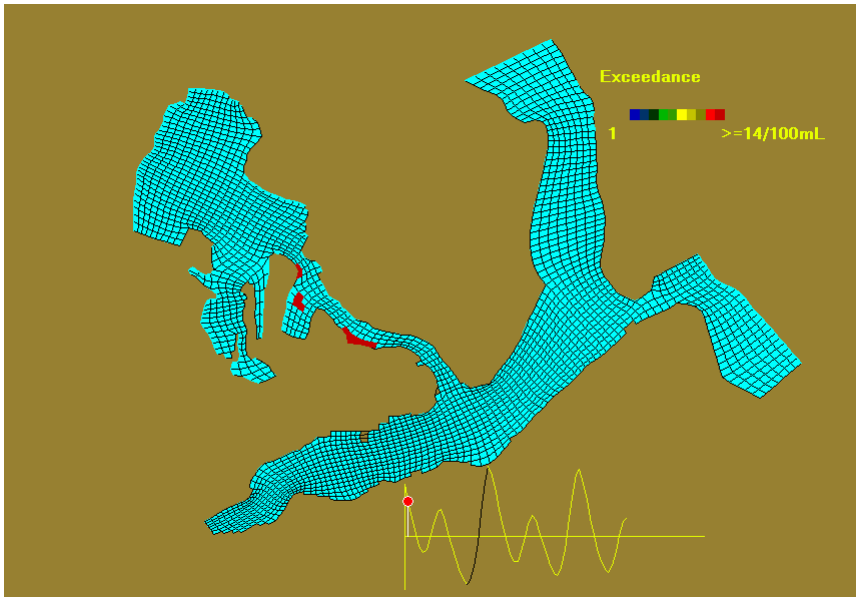

Area that exceeded shellfish standard during simulation of CSO event with improvements 100% complete.

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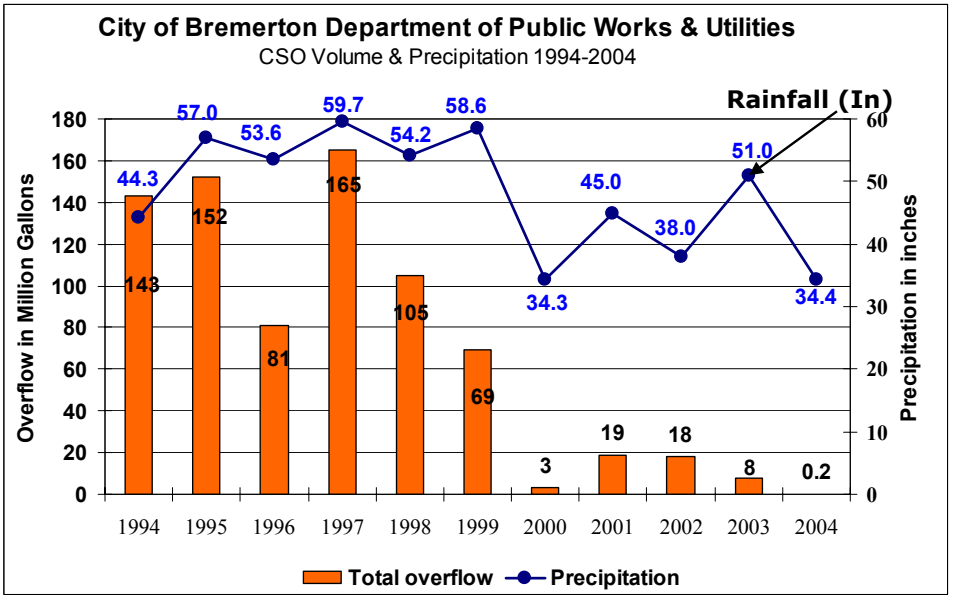
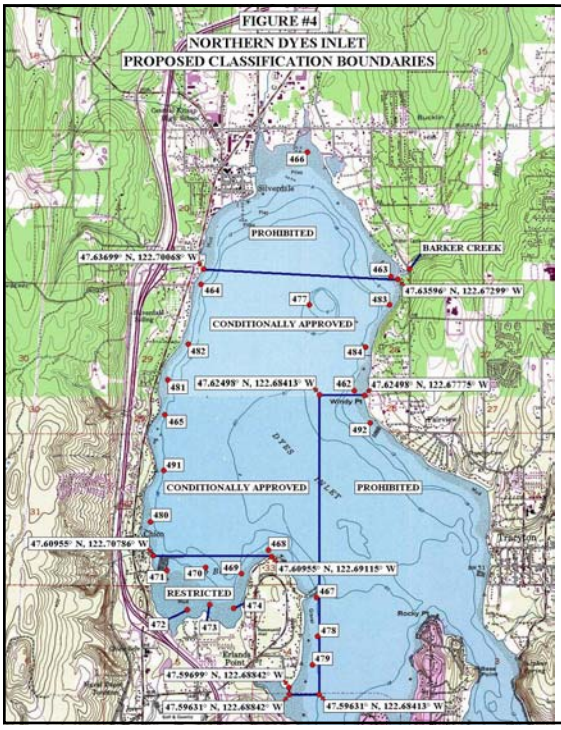
CSO Reduction Program





Northern Dyes Inlet

1500 acres reclassified for shellfish harvesting

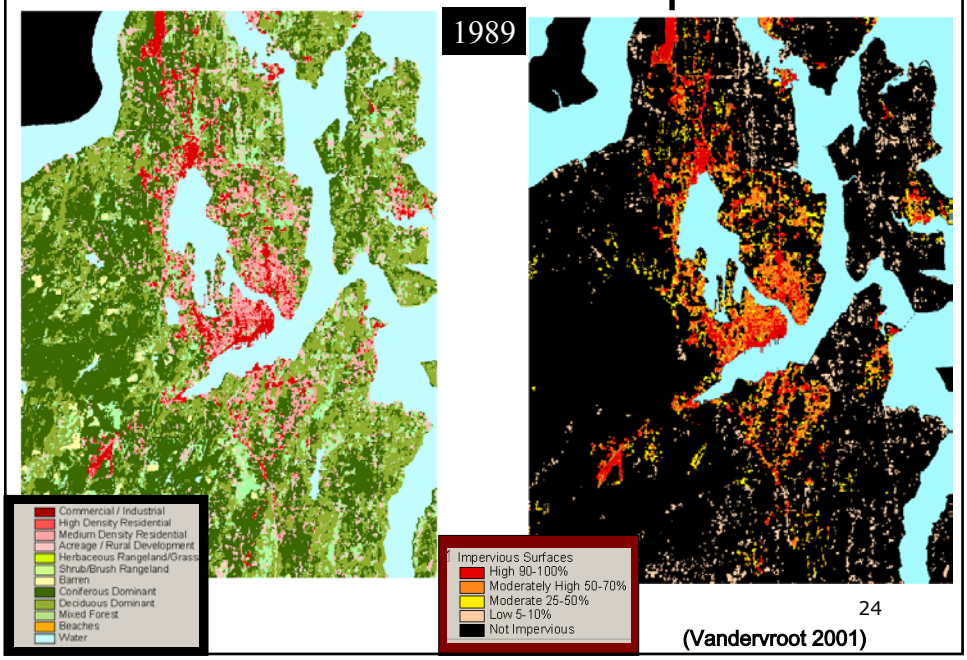
[Click here to load DOH Press Release http://www.doh.wa.gov/Publicat/2003_News/03-176.htm](http://www.doh.wa.gov/Publicat/2003_News/03-176.htm)

Watershed Development

- How will changes in land uses affect water quality?
- What is the relationship between land use and water quality?

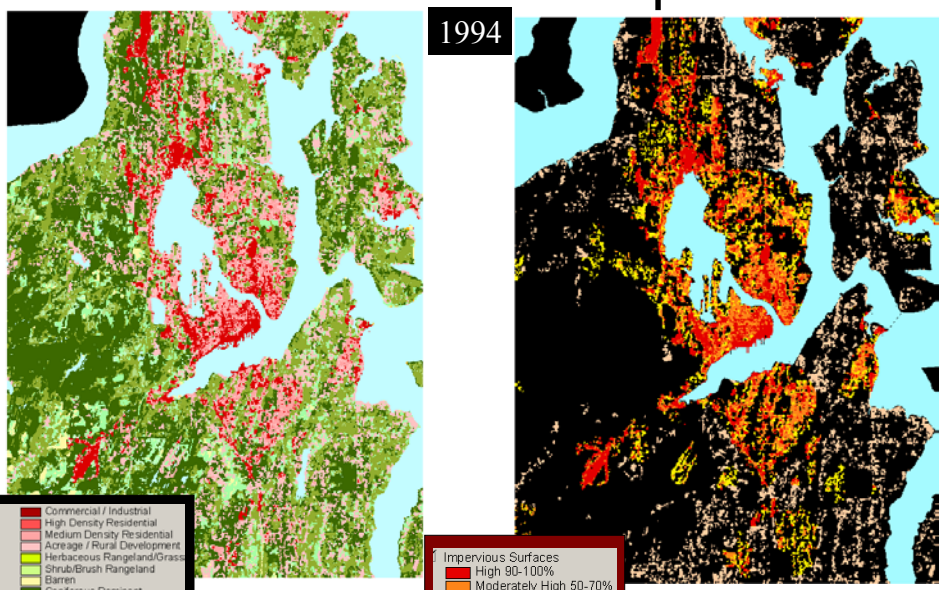
The models and data provide tools to address these questions.

Watershed Development



(Vandervroot 2001)

Watershed Development



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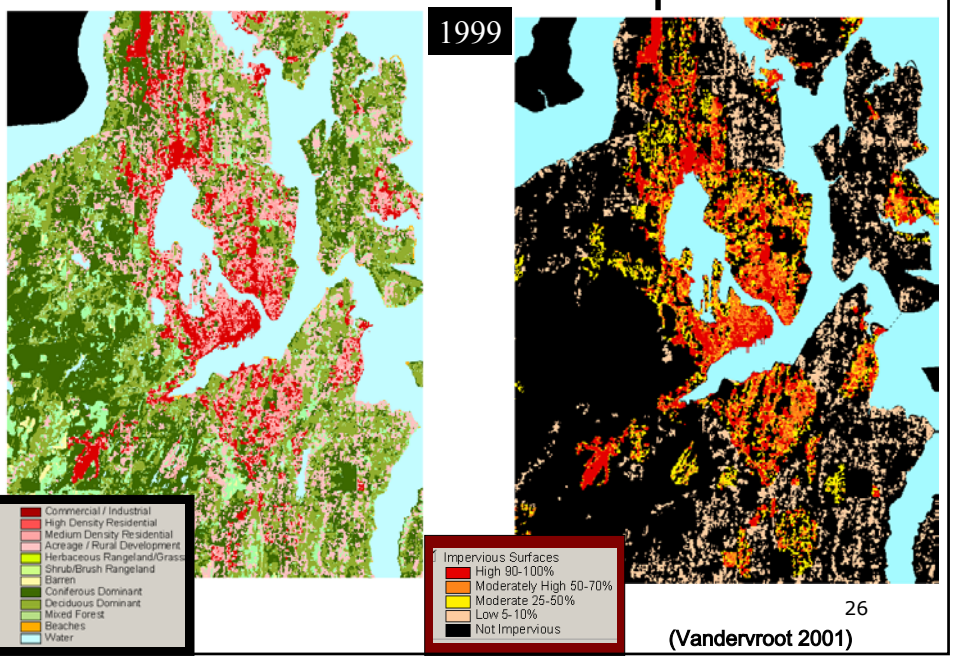
(Vandervroot 2001)

Watershed Development



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(Vandervroot 2001)

Next Steps

- Complete Model Linkage
- Verify Integrated Model
- Conduct Scenario Analysis
- Develop Water Cleanup Plan

Technical Reports

- An Analysis of Microbial Pollution in the Sinclair-Dyes Inlet Watershed
- Watershed Model Calibration Report for Streams and Storm Water
- Integrated Model Verification Report
- Simulation and Scenario Analysis Report

For More Information:

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